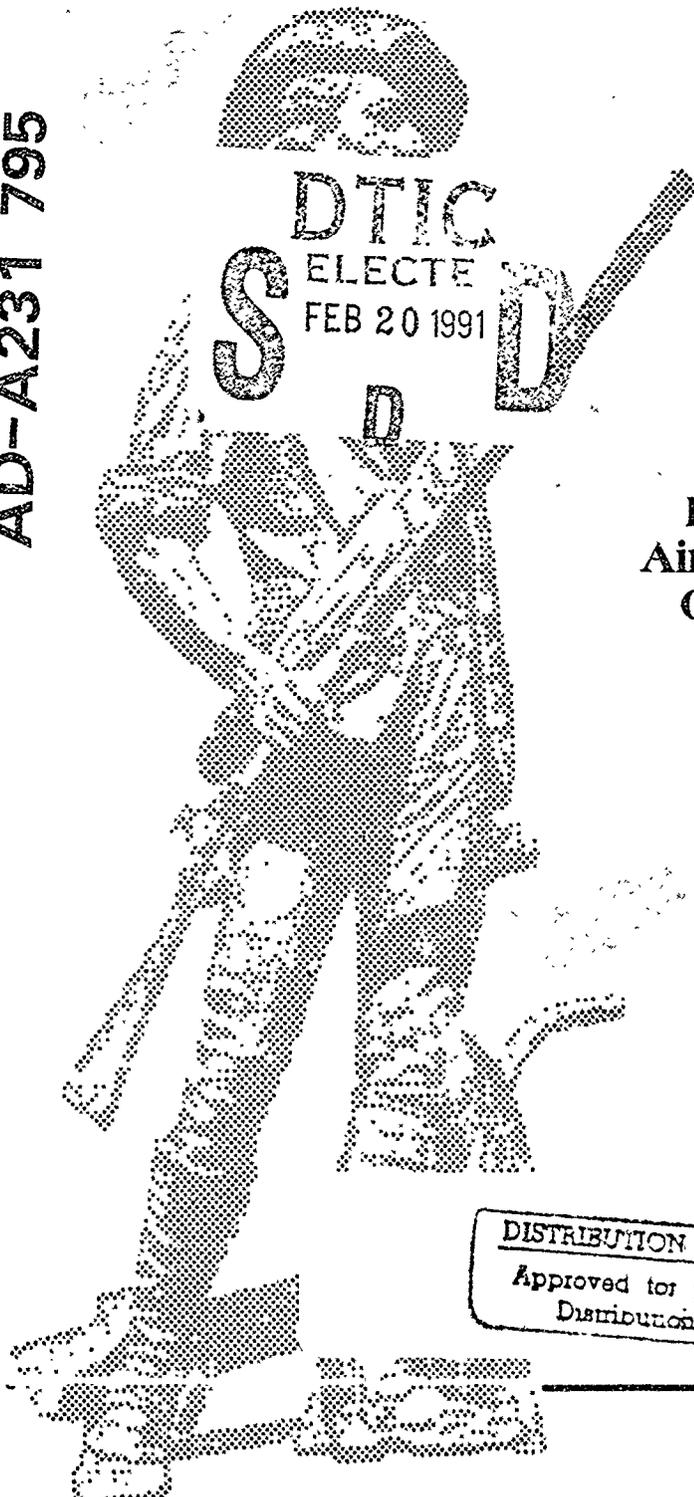


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INSTALLATION RESTORATION PROGRAM

AD-A231 795

Addendum to the
Phase I Records Search



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For Air Force Reserve and
Air National Guard Facilities at
General Billy Mitchell Field
Milwaukee, Wisconsin

DISTRIBUTION STATEMENT A
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Distribution Unlimited

Hazardous Materials Technical Center

November 1986

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ADDENDUM TO THE INSTALLATION
RESTORATION PROGRAM PHASE I RECORDS SEARCH

FOR AIR FORCE RESERVE AND
AIR NATIONAL GUARD FACILITIES AT GENERAL
BILLY MITCHELL FIELD, MILWAUKEE, WISCONSIN

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November 1986



Prepared for

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Prepared by

Hazardous Materials Technical Center
The Dynamac Building
11140 Rockville Pike
Rockville, Maryland 20852

Contract No. DLA 900-82-C-4426

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INTRODUCTION

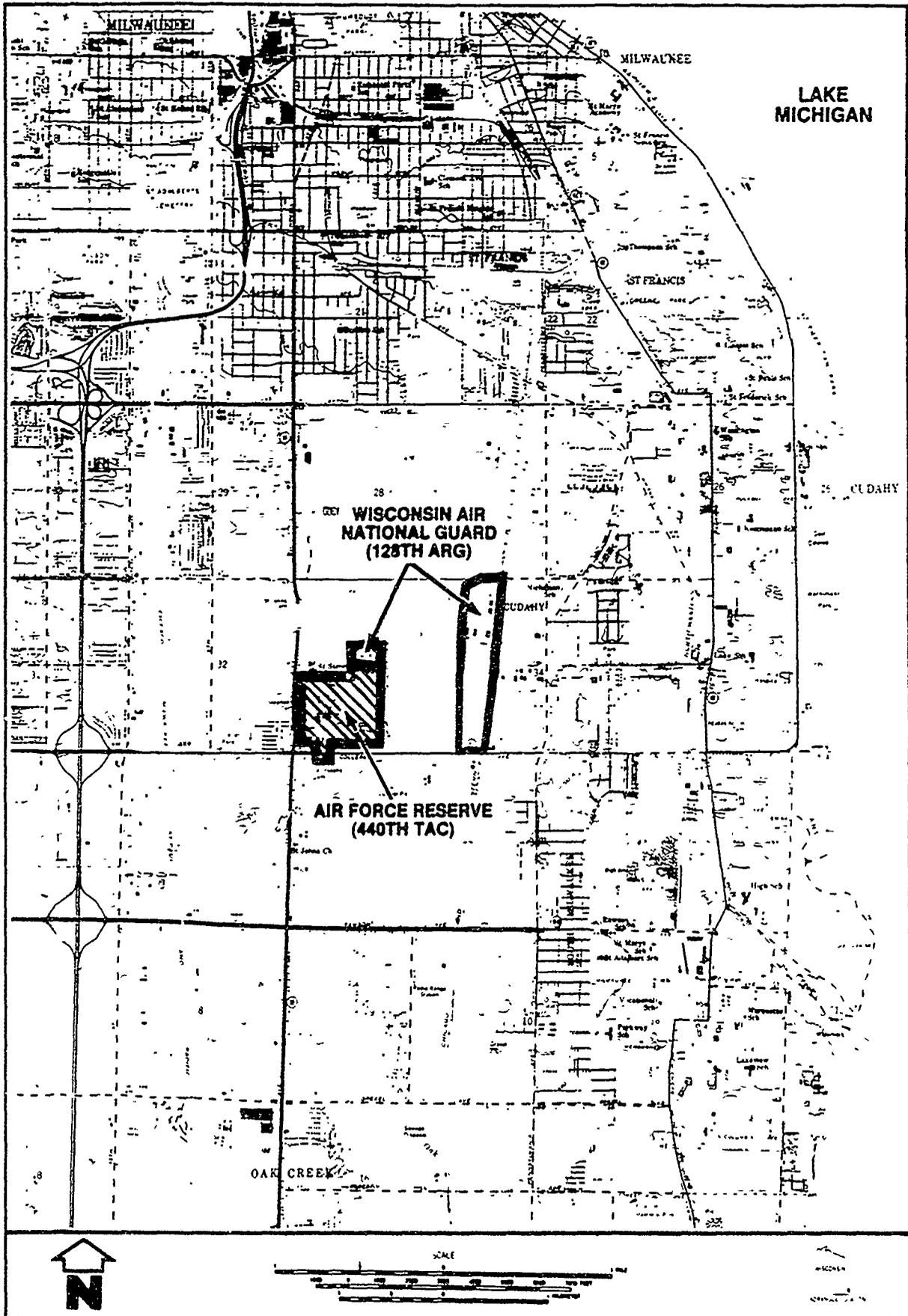
On 8-11 September 1986, a site visit was conducted by the Hazardous Materials Technical Center (HMTC) to the General Mitchell Air National Guard Base (ANGB), Milwaukee, Wisconsin. The purpose of the site visit was to conduct interviews and gather records necessary to prepare an addendum to the November 1984 "Installation Restoration Program (IRP) Phase I Records Search for the Air Force Reserve (AFRES) and Air National Guard (ANG) facilities at General Billy Mitchell Field, Milwaukee, Wisconsin," performed by Roy F. Weston, Inc. (Weston Report).

The intent of the HMTC site visit, and of this addendum, is to update the 1984 Weston Report, and to verify for the ANG, the data contained in the original Records Search. This addendum is not designed to stand alone as a separate document and should be read in conjunction with the Weston Report.

The Weston Records Search was conducted for AFRES, although it included ANG operations. The scope of this addendum includes only operations occurring at General Mitchell ANGB, and does not address AFRES operations. The Wisconsin ANG occupies two discrete locations at General Billy Mitchell Field (see Figure 1). The largest area is occupied by the 128th Air Refueling Group (ARG), Wisconsin ANG. A smaller portion of the Wisconsin ANG property is occupied by the 128th Tactical Control Flight (TCF). This area borders the AFRES facility, and is physically separate from the portion of the base occupied by the 128th ARG.

General background information regarding the environmental setting and installation description of the General Mitchell (ANGB) are contained within the Weston Report. Background data supporting these descriptions has been reviewed by HMTC and, except where noted, are considered an accurate presentation of physical and environmental conditions existing at General Mitchell ANGB. The environmental setting is briefly addressed in this addendum to add additional pertinent data, to clarify points made in the Weston Report, and to characterize specific sites on the base. However, for a

Location of General Mitchell ANGB, Milwaukee, Wisconsin.



*Adapted from Weston Records Search.

complete description of the environmental setting, the reader should refer to the Weston Report.

1. ENVIRONMENTAL SETTING

a. Surface Drainage

The area at General Billy Mitchell Field now occupied by the Wisconsin ANG was formerly swamp land. These swamp areas have been filled and constructed upon. The area immediately north of the Base boundary is a flooded marsh area sometimes referred to as "Bailey's Pond." According to City of Milwaukee Health Department Records, an inactive landfill area south of the Base, which is now owned by the Wisconsin ANG, is also filled swamp land. As a result of its location on former swamp land, the water table at the Base is high, some places within several feet of the surface. The shallow groundwater table contributes to poor drainage on the Base and contributes to groundwater susceptibility to contamination. Low lying areas of the Base near the north gatehouse are prone to minor flooding during periods of snow melt and prolonged precipitation. During the site visit, poor drainage, in the form of standing water, was visible on the 128th TCF portion of the Base. On 6 August 1986, flooding occurred on the Base as a result of 7 inches of rain falling within 24 hours. The worst flooding occurred on the 128th TCF portion of the Base.

b. Geology and Hydrology

The Weston Report indicates that General Mitchell Field ANGB is underlain by 150 to 300 feet of unconsolidated ground and end moraine glacial deposits. An HMTG review of well log data from wells installed in the vicinity of the Base indicates that glacial deposits at this location range from 80 to 140 feet, and do not extend to 300 feet. These glacial deposits are primarily made up of thick layers of clay and clayey silty till and lenses of stratified sand and gravel. Limestone and dolomite bedrock underlie the glacial deposits. Most wells in the area extend into this bedrock. The general prevalence of thick layers of clay underlying the General Mitchell ANGB would, where present, restrict the hydraulic connection between the

shallow and the deeper bedrock aquifer. However, soil boring and well log data indicate that clay layers are not uniformly present, or in some locations may be interbedded with permeable sands or gravel. Thus, a hydraulic connection may exist which could allow potential surface contaminants to reach the bedrock aquifer.

The City of Milwaukee operates a municipal water supply system, which supplies drinking water for most of the Greater Milwaukee area. The General Mitchell Field Airport, the 128th ARG, AFRES facilities, and residences and industries immediately surrounding ANG property are all connected to the municipal water system. Municipal water supplies are derived from Lake Michigan, located approximately 2 miles from the base. As a result of the distance between the municipal drinking water source and 128th ARG property there is no substantial threat posed to these drinking water supplies by past General Mitchell ANGB activities. However, facilities at the 128th TCF are not connected to the Milwaukee Municipal water supply. The 128th TCF obtains its drinking water from a well located in the Communications Facility Building (Building 301) (see Figure 2 for location). Analysis of 128th TCF well water samples shows contamination by low levels of chlorinated organic compounds. Sampling analysis reports for this well are found in the appendix of this addendum. The 128th TCF well is addressed in more detail in the Findings section of this document.

Wisconsin Department of Natural Resources well drilling records show the presence of numerous private residential wells within a mile of Wisconsin ANG property. It is undetermined if these wells are still operating, and if operating, whether they are used as drinking water sources. Regardless, all residences in the area are connected to the Milwaukee municipal water supply system. Thus, any wells which may still operate in this area do not represent the only source of drinking water for residents.

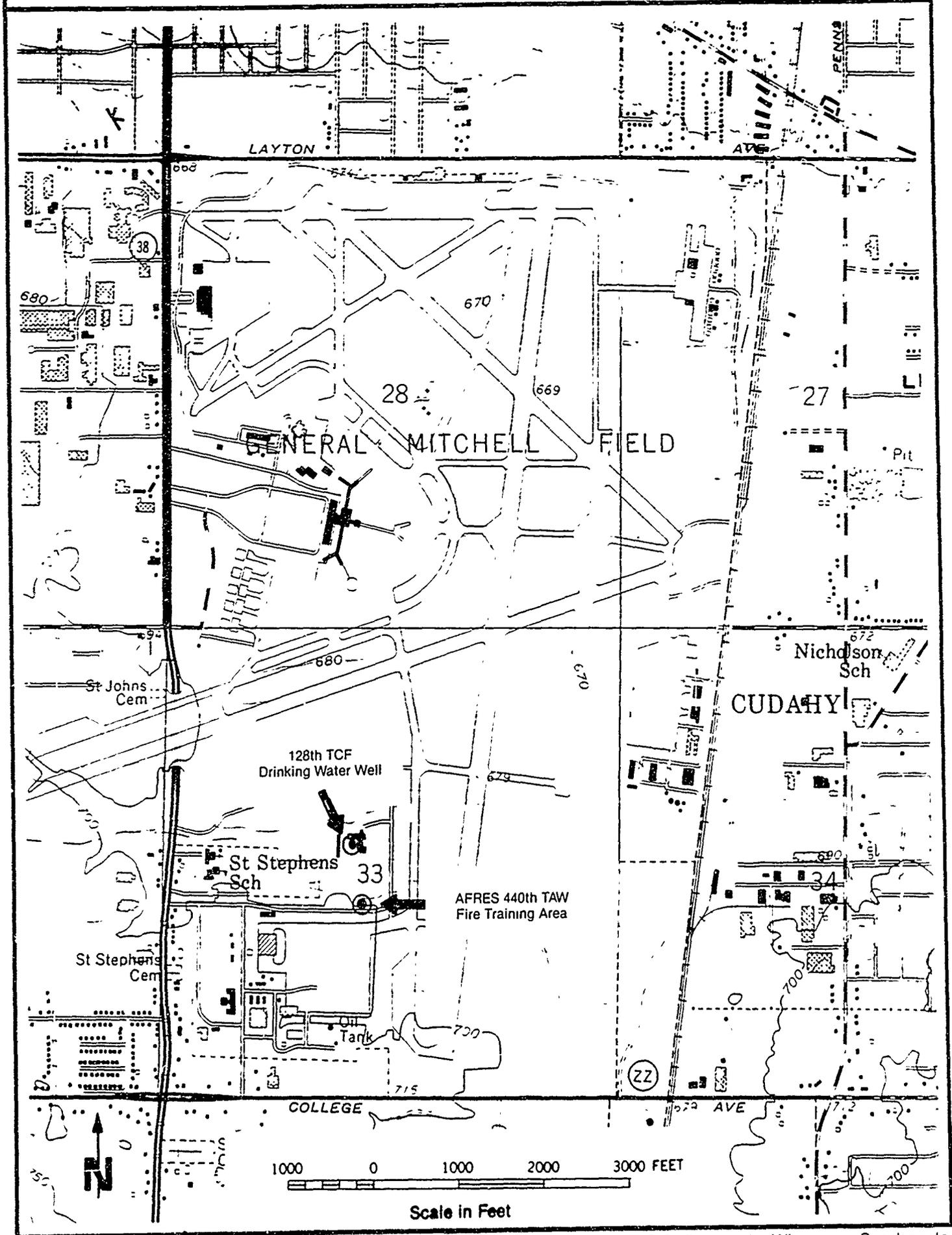
2. FINDINGS/CONCLUSIONS

In order to update the Phase I Records Search performed by Weston, and to verify the current accuracy of the data contained in the Weston Report,

Figure 2.



Location of AFRES FTA and Wisconsin ANG 128th TCF Well at General Mitchell Field, Milwaukee, Wisconsin.



HMTC reinterviewed personnel at the 128th ARG, and conducted shop visits and site tours. Except for a few instances, current hazardous waste management practices at the General Mitchell ANGB are as described in the Weston Records Search. HMTC also interviewed personnel and conducted site tours at the 128th TCF portion of General Mitchell ANGB. 128th TCF operations were not addressed in the Weston Report. The activities of the 128th TCF, and instances at the 128th ARG where waste management practices vary from those described in the Weston Report, are described below. Locations of sites referred to below are indicated in Figures 2 and 3.

a. 128th ARG Activities

A 500 gallon capacity underground storage tank (UST), located outside the 128th ARG Aerospace Ground Equipment (AGE) Shop (east side of Building 108), was identified as a site of environmental concern due to its use as a hazardous waste storage tank. This tank, which is estimated to have been in place since 1970, is used mainly for temporary storage of used engine oils prior to collection by a contractor. Historically, however, the tank has also served as a collection point for solvent wastes, mostly PD-680 generated by AGE and other shops on the base. For the most part, the practice of comingling spent solvent wastes with used oils has been discontinued. Most shops now collect used solvents in containers at their shop prior to removal to the centralized waste storage location. However, some shops indicate that they are still disposing of solvents in the AGE UST. Several hundred gallons of waste oils and lesser quantities of solvents and paint thinners are temporarily stored in the tank each year. Since there is no evidence of leakage from this tank, a HARM Score is not appropriate. However to determine the tank's integrity, it is recommended that it be leak tested. If the test indicates the tank is unsound, and that leakage may have occurred, IRP Phase II/IVA investigations may be required.

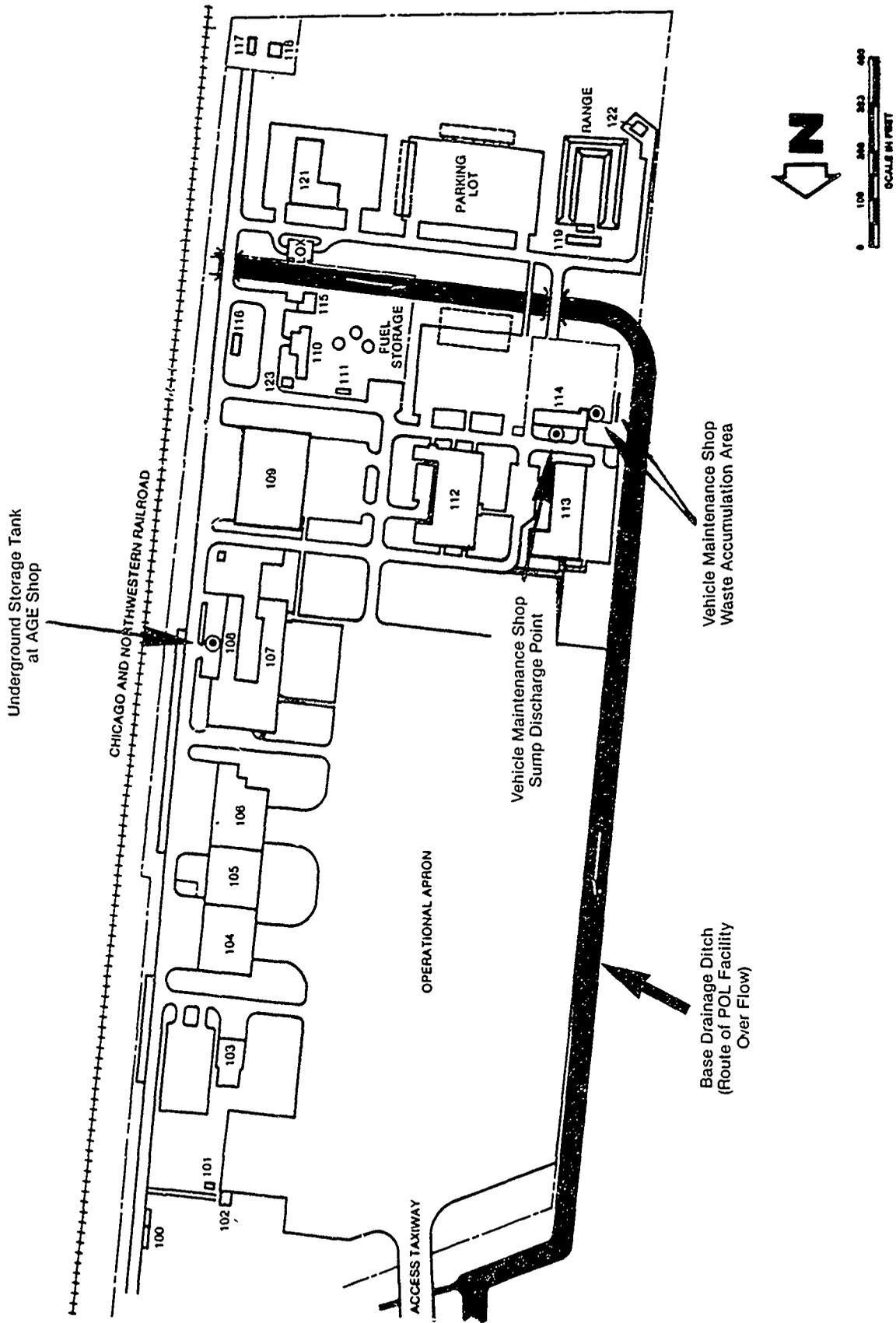
b. 128th ARG POL Spills

Section 4.4.3 of the Weston Report gives an accurate description of fuel spills which have occurred on 128th ARG property up to the time of their



Locations of Environmental Concern
at General Mitchell Field ANGB, Milwaukee, Wisconsin.

Figure 3.*



* Adapted from Weston Records Search.

investigation in 1984. Since 1984, two additional spills have occurred. On 20 February 1986, a JP-4 fuel spill of approximately 400 gallons occurred at the POL facility. The spill resulted from the malfunctioning of a refueling/defueling return valve. The spilled fuel was contained within the concrete diked area of the tank farm. The contained fuel was then drained into the POL facilities' 8,000 gallon capacity underground retention tank/oil/water separator (OWS). As the spill was well within the capacity of the OWS; there was no release of JP-4. This spill was completely contained, with no loss of contaminants to the environment. As such, a HARM Score is not appropriate, and no further action is required at this site.

On 11 March 1986, another release of JP-4 occurred on 128th ARG property. This spill occurred during a flooding event. During the flooding, a sump which prevents overflows from the POL spill retention tank malfunctioned, allowing JP-4 product to flow out of the tank and into a concrete drainage channel. A sheen was visible on the water in the drainage channel. Water in the drainage channel flows west from the POL facility, where it drains into an earthen ditch. The water then flows north, past the aircraft parking apron, ultimately draining into "Bailey's Pond," a marshland located at the low lying north end of the base. Absorbent booms were placed at three points along the drainage channel and were observed to be effective in absorbing the floating POL. The amount of JP-4 lost during this incident is unknown. Because this release occurred during the peak of a flood, JP-4 which was not contained by the booms, or which escaped prior to placement of the booms, floated on top of the running water in the drainage ditch may have washed off the base. Due to the large volume of water flowing in local streams and rivers during the flood, it is doubtful that contaminants would have settled in the drainage ditch or stream bed sediments. Flooding at the time of the spill would ensure a high dilution factor of any contaminants which were not recovered. In light of the above, HARM Scoring is considered unnecessary and no further action is required.

c. Other Locations of Environmental Concern at the 128th ARG

1. Vehicle Maintenance Shop

Two locations at the 128th ARG Vehicle Maintenance Shop show evidence of minor environmental stress. On the west side of the building, there is an asphalt pad used as a hazardous waste accumulation point for Vehicle Maintenance Shop wastes. The asphalt pad also contains the opening for a used oil UST used by vehicle maintenance. Used solvents, paint thinners and oils are stored in drums and containers at this site. When HMTC visited this site, there was an open pail and a pan, containing what appeared to be used oil, sitting on the asphalt area. The condition of the site does not suggest the occurrence of significant spills, but does indicate minor spills or leaks of a recurring nature. There is no grass growing along a small section of the western edge of the asphalt pad, and both the pad and soil along the west edge are oil stained. There are no berms or containment structures at the site to prevent runoff of spilled contaminants. Open pails and containers at this site present the continued potential for contaminant overflow in the event of rainfall.

A second area at the Vehicle Maintenance Building exhibiting visible environmental stress is on the north side of building where water is discharged out of a sump pipe. This sump drains water which seeps into the vehicle maintenance hydraulic lift pit. Small amounts of residual oils and hydraulic fluid are pumped out with this water. These oils have soaked into the ground where the oil/water mixture is discharged. There is a small band of oil-stained soil at the sump discharge point, and grass does not grow on this soil. The extent of vegetative stress at this site is minor, indicating that the amount of contaminants released at the site is small.

Due to the small quantities of materials released at the two Vehicle Maintenance Shop sites, a significant environmental or health threat does not exist. There appears to be negligible potential for contaminant migration offbase or into the water table. This conclusion is based upon consideration of the slow permeability (0.2-0.8 in/hr. (Skinner)) of surface soils in the area and the small quantity of material released. The airport,

ANG (128th ARG), and local residences, are all connected to the Municipal water supply and do not use local groundwater as drinking water. The closest well is that of the 128th TCF, located approximately three quarters of a mile from these sites. This well is screened at a depth of approximately 270 feet. The likelihood that the small volume of contamination present at this site could reach this depth of 270 feet is negligible. The potential for contaminant migration via surface runoff does exist. However, the limited quantities of contaminants present at this site would be sufficiently diluted to negligible concentrations in surface runoff. Because there is little chance for contaminant migration and no likely human receptors, this site was not HARM scored, and with the exception of minor remedial measures such as those suggested below, no further action is required.

Since the opportunity for continued minor contaminant releases does exist at the Vehicle Maintenance sites, it is recommended that remedial measures be taken to abate their occurrence. Removal of open pans and buckets and the installation of a spill containment curb are possible remedial measures at the vehicle maintenance waste accumulation area. Routing of the sump discharge pipe for the vehicle maintenance hydraulic vehicle lift to an OWS would abate releases of oil-tainted water into the environment. These or similar remedial actions should be initiated as soon as possible.

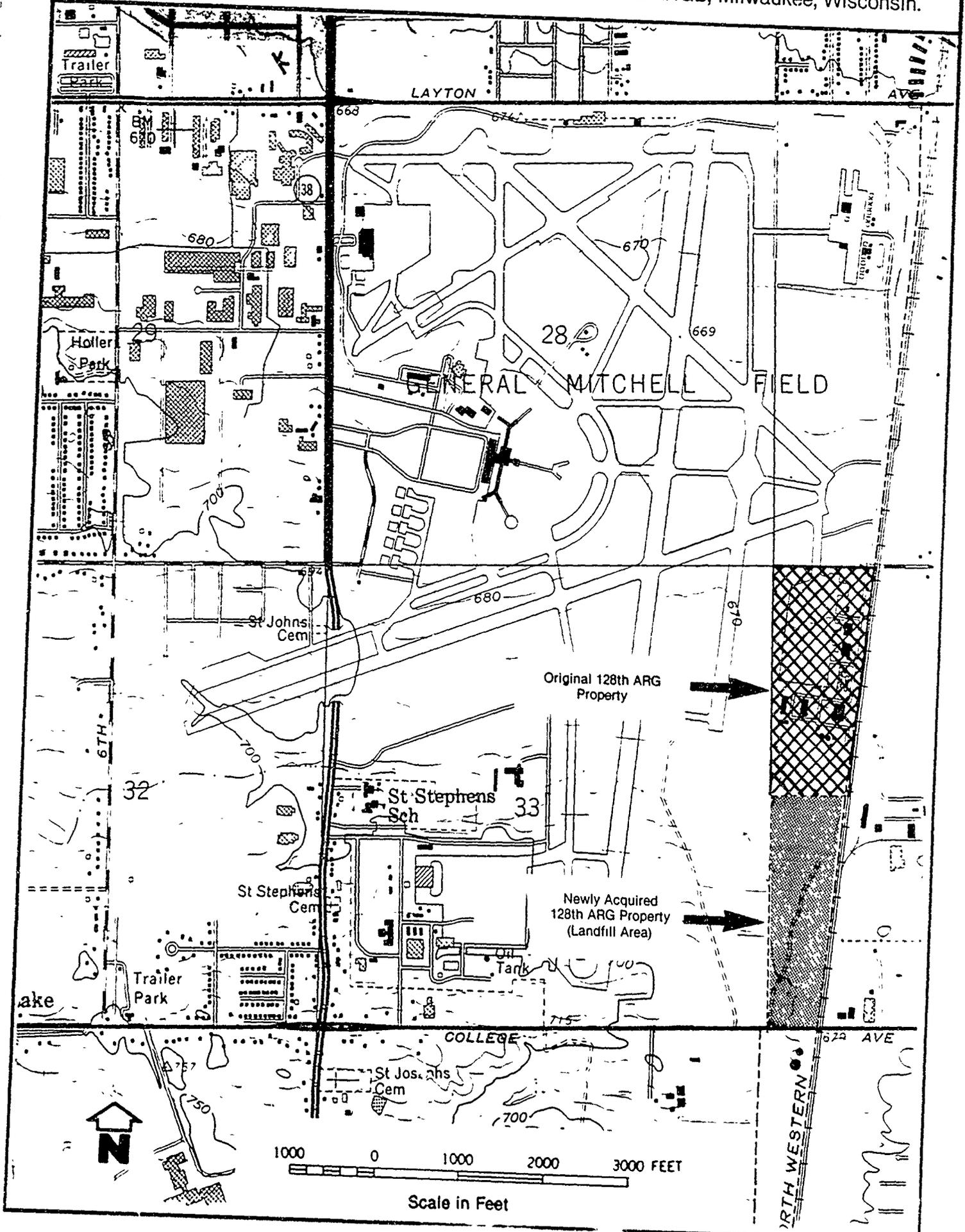
2. Old Rubble Landfill Area

In 1986, 128th ARG acquired a landfill previously owned by the City of Milwaukee. There is no evidence that the landfill was used as a sanitary landfill, or for disposal of hazardous wastes. As is indicated in Figure 4, the landfill is located between what was previously the southern border of the base, and College Avenue. Inquiries were made to the City of Milwaukee Health Department's Sanitation Section concerning the nature and history of the landfill. City records on the subject were sparse. City officials estimate that the landfill was in use prior to the 1940's until 1985. Types of materials disposed of in the landfill are reported to consist of cans, bottles, and scrap metals. In recent years, the site was used for road construction rubble and gravel disposal. The site was also used for

HMTD

Figure 4.

Newly Acquired Property at General Mitchell Field ANGB, Milwaukee, Wisconsin.



disposal of leaves by the City.

The 128th ARG has excavated several test pits at the landfill with backhoes. The excavations are to a depth of four feet. Materials unearthed are consistent at each of the excavations, consisting of bottles, rusted cans, plastic containers, gravel, concrete, and scrap metal. Earth in other areas of the landfill has been moved and graded in order to provide an entranceway to the 128th ARG. Materials revealed during the grading process were identical to those found in the test pits. Upon touring the landfill, HMTC saw no evidence of hazardous waste disposal from materials exposed on the surface. As there is no evidence that hazardous wastes have ever been disposed of at the landfill, HARM Scoring is not considered necessary, and no further action is required.

d. 128th TCF Activities

Hazardous waste related activities at the 128th TCF portion of General Mitchell ANGB were not included in the Weston Report. These activities are summarized below.

The mission of the 128th Tactical Control Flight is to operate and maintain a mobile radar unit. Support for this mission does not require a large scale operation and, consequently, there are few shops which use hazardous materials or generate hazardous waste at the 128th TCF. Shops at the 128th TCF that do generate hazardous wastes requiring disposal include an AGE shop and a Vehicle Maintenance shop. Wastes generated by these shops include PD-680, used oils, battery electrolyte, used batteries, and paint wastes. The majority of these wastes are accumulated in drums at the AGE and Vehicle Maintenance Shops. Once a drum is filled, it is moved to the central hazardous waste accumulation point at the POL facility located on 128th ARG property. Electrolyte is neutralized in sinks and released into the sanitary sewer system for further treatment. Used batteries are recycled through Defense Reutilization Marketing Office. Used oils are stored in a UST in front of the 128th TCF AGE shop. This tank stores only used oil and has not been used to store waste solvents. Other UST at the 128th TCF include a

heating oil tank at the south end of Building 301 and a heating oil tank at the south end of the vehicle maintenance complex. There is also a 2,500 gallon capacity gasoline UST and a 5,000 gallon diesel fuel UST located at the 128th TCF vehicle fueling island. There are no indications of leakage from 128th TCF UST. A diesel fuel spill once occurred at the fueling island as a result of a tank overfill. The spill was quickly contained with absorbent materials and did not escape past the surrounding asphalt surface. Besides this spill, interviewees at the 128th TCF recalled no other hazardous waste releases.

The 128th TCF obtains drinking water from a well located in Building 301 (see Figure 2). Analysis of 128th TCF well water samples shows contamination by low levels of chlorinated organic compounds. Sampling analysis reports for this well are found in the appendix of this addendum. No contaminant spills are reported to have occurred at the 128th TCF to account for the presence of these contaminants. However, the well is located approximately 500 feet topographically downgradient of an operating fire training area (FTA) used by AFRES (see Figure 2).

AFRES fire training operations are described in the Weston Report however, mention of an active downgradient well is omitted. JP-4, spent solvents and other flammable hazardous materials have been routinely released into this FTA, which has been in operation since the activation of the AFRES facility in the 1940s. During the 1960s and 1970s, an area adjacent to the FTA was used as a hazardous waste storage site. Since 1980, AFRES reconstructed the FTA installing berms and a concrete pad. HMTc visited FTA during a rainstorm. At this time, rainwater was running over the berm and onto the surrounding gravel. Prior to 1980, the AFRES FTA consisted of a clay lined pit. The Weston Report questioned the integrity of the pit's clay liner.

Contaminants infiltrating groundwater at the AFRES FTA, which is topographically higher than the 128th TCF well, may or may not flow in the general direction of the well.

Whether or not potential contaminants from the AFRES FTA could

reach the screened interval of the 128th TCF drinking water well depends on the permeability of the clay layers which separate the water table aquifer from the bedrock aquifer. The well log for the 128th TCF well shows the presence of a 30 foot thick clay layer at a depth of approximately 30 feet. Typically, clay layers found in glacial till are of variable continuity, and may contain lenses of higher permeability through which shallow contaminated groundwater could migrate. Pumping of the 128th TCF well could influence the flow of contaminants towards the screened interval of the well by creation of a cone of depression. However, the extent of this influence may be mitigated by the presence of the above mentioned clay layers. It is also possible for the outside of the well casing of the 128th TCF well to act as a conduit for vertical transport of contaminants towards the screened interval of the well.

Thorough characterization of the potential for contamination of the 128th TCF well would require a detailed study. It should be noted that there are numerous industries in the area surrounding Billy Mitchell Field. It is possible that these industries may use and discard chlorinated organic compounds. However, determination of the precise source of groundwater contamination is beyond the scope of this addendum. AFRES is initiating IRP Phase II activities in the vicinity of this well. Phase II investigations are to confirm the presence of groundwater contamination, and if contamination is present, to identify the source and direction of the contaminant plume.

e. Summary

Table 4-7 of the Weston Report identified three areas of environmental concern at the 128th ARG. These areas include a former hazardous waste storage area, located on the east side of Building 109 (the supply building), a storage tank for PD-680 (new product) on the east side of Building 108, and an area used one time for the disposal of JP-4 saturated spill absorbent material. These areas are described in detail in the Weston Report. None of these sites was HARM Scored.

As a result of the HMTc site visit, several additional sites of

environmental concern have been identified at the 128th ARG portion of General Mitchell Field ANGB. These sites include a drainage ditch which was the receptor of a POL release, two locations at the 128th ARG Vehicle Maintenance Shop involving minor contaminant releases, a newly acquired inactive rubble landfill, and a UST at the 128th AGE Shop that is used as an accumulation point for waste oils and used solvents. With the exception of the UST at the AGE Shop, none of the above sites is considered to present a risk to human health and environment, or to have the potential for contaminant migration. The rationale for these conclusions is presented in the Findings section of this addendum. None of these sites is HARM scored and with the exception of minor preventative measures at the Vehicle Maintenance Shop, no further action is required.

The AGE Shop UST presents an environmental concern because of its use as a holding tank for spent solvents since 1970. Although no leaks have been reported from this tank, there is not a strict inventory program to detect loss of its contents, and the tank has not been leak tested. To determine the integrity of this tank, it is recommended that the tank be leak tested. If the leak test indicates the tank is unsound, and that leakage may have occurred, IRP Phase II/IVA investigations of the tank area may be required. However, until evidence of leakage is found, a HARM rating is not considered appropriate.

An additional environmental concern identified involves the operating well located at the 128th TCF, and its proximity to the AFRES FTA. Although there is no direct evidence of contaminant migration from the FTA to the well through groundwater, it is a potential environmental risk which should be investigated. It is recommended that this well be sampled on a regular basis and analyzed for petroleum hydrocarbons, and aromatic and halogenated volatile organics. The FTA has been identified as a site and HARM Scored in the Weston Report. Thus, IRP Phase II investigations will be undertaken at the FTA in the future by AFRES.

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2. Skinner, Earl L., Water Resources of Wisconsin - Lake Michigan Basin, Hydrologic Investigations Atlas HA-432 (Sheet 1 of 4); United States Geological Survey, Washington, D.C., 1983.
3. Wisconsin Department of Natural Resources (DNR) Microfiche of Well Construction Reports for Milwaukee County, Milwaukee, Wisconsin, TGN R22E (14 Fiche), Wisconsin DNR; Madison, Wisconsin, Bureau of Water Supply, Private Water Supply Section.
4. City of Milwaukee Health Department Records regarding College Avenue Landfill and interview with Milwaukee Health Department Employee William Hudson on 10 September 1986, City of Milwaukee Health Department, Munciple Building, 841 North Broadway, Milwaukee, Wisconsin.
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APPENDIX

Analytical Results of 128th Well Water Sample

ENVIRONMENTAL SAMPLING DATA

(Use this space for mechanical imprint)

0072 PD 013
 128 TACTICAL CONTROL FLIGHT
 SEN. BILLY MITCHELL FIELD
 1919 E. GRANGE AVE
 MILWAUKEE WI 53207

SAMPLING SITE IDENTIFIER (AFR 19-7)

BASE WHERE SAMPLE COLLECTED

SAMPLING SITE DESCRIPTION

DATE COLLECTION BEGAN

TIME COLLECTION BEGAN

COLLECTION METHOD

8 5 10 3 10 11

1700

GRAB COMPOSITE _____ HOURS

MAIL REPORTS TO (circle if changed)

ORIGINAL 0 0 9 8
 COPY 1 0 0 7 2
 COPY 2

USAF HOSPITAL 7567 B RLSANITARY AFS MIL 49843-50
 128 ARG, 1919 E. GRANGE AVE, MILWAUKEE WI 53207
 (ATTN) 28 Rms/DG

SAMPLE COLLECTED BY (Name, Grade, AFSC)

SIGNATURE

AUTOVON

MSGT Newcomb, 90770

Tom R. Newcomb

422-2942

REASON FOR SUBMISSION

R

A-ACCIDENT/INCIDENT
 R-ROUTINE/PERIODIC

C-COMPLAINT
 N-NPDES

F-FOLLOWUP/CLEANUP
 O-OTHER (specify)

BASE SAMPLE NUMBER

6P 85 0076

ANALYSES REQUESTED (check appropriate blocks)

GROUP A	GROUP B	GROUP C	GROUP D	GROUP E	GROUP F	GROUP G	GROUP H	GROUP I	GROUP J
<input checked="" type="checkbox"/> Ammonia 00610	<input checked="" type="checkbox"/> Hardness 00900	<input checked="" type="checkbox"/> Iron 01045	<input checked="" type="checkbox"/> Residue, Settleable 50086	<input checked="" type="checkbox"/> Bromoform 32104					
<input checked="" type="checkbox"/> Chemical Oxygen Demand 00340	<input checked="" type="checkbox"/> Lead 01051	<input checked="" type="checkbox"/> Magnesium 00927	<input checked="" type="checkbox"/> Residue, Volatile 00505	<input checked="" type="checkbox"/> Bromodichloromethane 32101					
<input checked="" type="checkbox"/> Kjeldahl Nitrogen 00625	<input checked="" type="checkbox"/> Manganese 01055	<input checked="" type="checkbox"/> Mercury 71900	<input checked="" type="checkbox"/> Silica 00955	<input checked="" type="checkbox"/> Carbon Tetrachloride 32102					
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<input checked="" type="checkbox"/> Organic Carbon 00680	<input checked="" type="checkbox"/> Tellurium 01059	<input checked="" type="checkbox"/> Zinc 01092	<input checked="" type="checkbox"/> Surfactants -MBAS 38260	<input checked="" type="checkbox"/> Methylene Chloride 34423					
<input checked="" type="checkbox"/> Orthophosphate 00671	<input checked="" type="checkbox"/> Thallium 01059	<input checked="" type="checkbox"/> Aluminum 01092	<input checked="" type="checkbox"/> Turbidity 00076	<input checked="" type="checkbox"/> Tetrachloroethylene 34475					
<input checked="" type="checkbox"/> Phosphorus, Total 00665	<input checked="" type="checkbox"/> Vanadium 01059		<input checked="" type="checkbox"/> BHC Isomers 39340	<input checked="" type="checkbox"/> 1,1,1-Trichloroethane 34506					
			<input checked="" type="checkbox"/> Chlordane 39350	<input checked="" type="checkbox"/> Trichloroethylene 39180					
			<input checked="" type="checkbox"/> DDT Isomers 39370	<input checked="" type="checkbox"/> Trihalomethanes 32080					
			<input checked="" type="checkbox"/> Dieldrin 39380	<input checked="" type="checkbox"/> PCBs 39516					
			<input checked="" type="checkbox"/> Endrin 39390						
<input checked="" type="checkbox"/> Phenols 32730	<input checked="" type="checkbox"/> Acidity, Total 70508	<input checked="" type="checkbox"/> Alkalinity, Total 00410	<input checked="" type="checkbox"/> Heptachlor 39410						
	<input checked="" type="checkbox"/> Alkalinity, Bicarbonate 00425	<input checked="" type="checkbox"/> Bromide 71870	<input checked="" type="checkbox"/> Heptachlor Epoxide 39420						
	<input checked="" type="checkbox"/> Antimony 01097	<input checked="" type="checkbox"/> Carbon Dioxide 00405	<input checked="" type="checkbox"/> Lindane 39782						
<input checked="" type="checkbox"/> Arsenic 01002	<input checked="" type="checkbox"/> Bromide 71870	<input checked="" type="checkbox"/> Chloride 00940	<input checked="" type="checkbox"/> Methoxychlor 39480						
<input checked="" type="checkbox"/> Barium 01007	<input checked="" type="checkbox"/> Carbon Dioxide 00405	<input checked="" type="checkbox"/> Color 00080	<input checked="" type="checkbox"/> Toxaphene 39400						
<input checked="" type="checkbox"/> Beryllium 01012	<input checked="" type="checkbox"/> Chloride 00940	<input checked="" type="checkbox"/> Fluoride 00951	<input checked="" type="checkbox"/> 2,4-D 39730						
<input checked="" type="checkbox"/> Boron 01022	<input checked="" type="checkbox"/> Color 00080	<input checked="" type="checkbox"/> Iodide 71865	<input checked="" type="checkbox"/> 2,4,5-TP-Silvex 39760						
<input checked="" type="checkbox"/> Cadmium 01027	<input checked="" type="checkbox"/> Fluoride 00951	<input checked="" type="checkbox"/> Odor 00086	<input checked="" type="checkbox"/> 2,4,5-T 39740						
<input checked="" type="checkbox"/> Calcium 00916	<input checked="" type="checkbox"/> Iodide 71865	<input checked="" type="checkbox"/> Residue, Total 00500							
<input checked="" type="checkbox"/> Chromium, Total 01034	<input checked="" type="checkbox"/> Residue, Filterable (TDS) 70300	<input checked="" type="checkbox"/> Residue, Nonfilterable 00530							
<input checked="" type="checkbox"/> Chromium VI 01032	<input checked="" type="checkbox"/> Sulfides 00745								
<input checked="" type="checkbox"/> Copper 01042									

REMARKS

LABORATORY PERFORMING ANALYSIS 3. LAB SAMPLE NUMBER 4. REQUESTOR SAMPLE NUMBER
 DEHL 17681-686 GP850076 00029

7. SITE DESCRIPTION 13 MAR 1985 14
 8. SITE LOCATION NO 9. FLOWRATE AT SITE 00088 GAL/MIN 10. WEATHER 00041
 11. COLLECTION DATE/PERIOD 12. NAME OF COLLECTOR 19. RESULTS OF OTHER ON-SITE ANALYSES
 13. SAMPLING TECHNIQUE 14. PHONE NUMBER
 15. REASON FOR SAMPLE SUBMISSION

ANALYSES REQUESTED AND RESULTS

A. PRIMARY DRINKING WATER STANDARDS (40CFR 141)

PRESERVATION GROUP F (85)				PRESERVATION GROUP C (88)			
PARAMETER	TOTAL	µG/L	MAX LEV ALLWD	PARAMETER	TOTAL	MG/L	MAX LEV ALLWD
ARSENIC	01002	<10	50 µG/L	NITRATE AS N (Cadmium Reduction Method)	00620	0.1	10 MG/L
BARIUM	01007	<200	1000 µG/L	PRESERVATION GROUP G (89)			
CADMIUM	01027	<10	10 µG/L	FLUORIDE	00951	0.8	See table in AFR 161-46
CHROMIUM	01034		50 µG/L	TURBIDITY	00076	Units	1 Unit
LEAD	01051	<20	50 µG/L	GROUP B nitrate 4.3			
MERCURY	01900	<1	2 µG/L	GROUP C ammonia 1.0			
SELENIUM	01147	<10	10 µG/L	Orthophosphate 4.1			
SILVER	01077	<10	50 µG/L	Phosphate 4.1			

B. OTHER ANALYSES

PRESERVATION GROUP F			PRESERVATION GROUP G		
PARAMETER	TOTAL	µG/L	PARAMETER	TOTAL	MG/L
COPPER	01042	<20	Acidity, Mineral As CaCO ₃	00436	
IRON	01045	370	Acidity, Total, As CaCO ₃	00435	0
MANGANESE	01055	<50	Alkalinity, Phenolphthalein As CaCO ₃	00415	0
ZINC	01092	77	Alkalinity, Total, As CaCO ₃		125
CALCIUM As Ca	00916	38.7 mg/l	Chloride	00949	4
MAGNESIUM As Mg	00927	20.9 mg/l	Hardness As CaCO ₃	00900	
POTASSIUM	00937	mg/l	Residue, Filtrable (TDS)	00515	340
SODIUM	00929	35.4 mg/l	Residue, Non-Filtrable (SS)	00530	
Chromium VI		<50	Residue	00500	381
Aluminum		<100 µg/l	Specific Conductance	00095	540 µmhos

ORGANIZATION REQUESTING ANALYSIS (FRCVP) Cyanide Total = <0.01 mg/l
 In Rec 17 Apr 85 684 (GRUPE) Phosphate <10 mg/l
 CHEMIST BS RB
 JHO KPH / FET
 Reviewed by
 Approved by
 K. L. Sawyer AFB

LABORATORY ANALYSIS REPORT AND RECORD (General)

DATE
25 MAR 85

FROM: USAF OEHL/SA
BROOKS AFB TX 78235-5000

LABORATORY IDENTIFY
LABORER K. I. SAWYER AFB

DATE RECEIVED
14 MAR 85

SAMPLE FROM

LAB CONTROL NO
17687

TEST FOR
Volatile Halocarbons

Methodology: EPA Method 601

OEHL NO:	17687				DEF.
BASE NO:	GP856077				LIMI
Bromodichloromethane	ND				0.1
Bromoform					0.2
Bromomethane					1.0
Carbon Tetrachloride					0.1
Chlorobenzene					0.2
Chloroethane					0.5
2-Chloroethylvinyl ether					0.1
Chloroform					0.1
Chloromethane					0.1
Dibromochloromethane					0.1
1,2-Dichlorobenzene					0.2
1,3-Dichlorobenzene					0.2
1,4-Dichlorobenzene					0.2
Dichlorodifluoromethane					0.2
1,1-Dichloroethane					0.2
2-Dichloroethane					0.2
1,1-Dichloroethene					0.2
trans-1,2-Dichloroethene					0.2
1,2-Dichloropropane					0.2
cis-1,3-Dichloropropene					0.2
trans-1,3-Dichloropropene					0.2
Methylene Chloride	4.7				0.2
1,1,2,2-Tetrachloroethane	ND				0.2
Tetrachloroethylene	0.2				0.2
1,1,1-Trichloroethane	2.4				0.2
1,1,2-Trichloroethane	ND				0.2
Trichloroethylene	5.8				0.2
Trichlorofluoromethane	ND				0.2
Vinyl Chloride	ND				0.2

Results in Micrograms per Liter

DATE ANALYZED: 14 MAR 85 128th - Milwaukee

REQUESTING AGENCY (Mailing Address)
USAF HOSP / 56PB
KI Sawyer AFB, MI
49843-5300

ND-NONE DETECTED, LESS THAN THE DETECTION LIM
TRACE-PRESENT BUT LESS THAN THE QUANTITATIVE

A Z Willis
Technician

[Signature]
716 Milwaukee